

1 INVENTION: COMBINATION SWIMMING, WALKING, RUNNING, MASSAGE,  
2 THERAPEUTIC, AND RECREATIONAL DEVICE

3 INVENTOR: John A. Turak  
4 33 E. Park St., Apt. #5  
Elizabethtown, PA 17022

5 Anson J. Flake  
6 4122 Nantucket Drive  
Mechanicsburg, PA 17055

7 ASSIGNEE: HydroWorx International, Inc.  
8 1961 Fulling Mill Road  
Middletown, PA 17057

9  
10 BACKGROUND OF INVENTION:

11 This invention relates to the field of aquatic exercise,  
12 therapy, fitness and recreational devices.

13 Current devices related to this include spas used for  
14 recreation and massage; deep tank treadmill devices having a  
15 treadmill at the bottom of a deep tank of water, currently costing  
16 well over \$100,000.00; large, shallower swim jet tanks allowing a  
17 swimmer to swim in place against the flow of fast moving water  
18 provided by swim jets placed at the front of the tank, also used  
19 primarily in commercial settings, and expensive as well. Except  
20 for the typical, small, home massage and swim spas, these  
21 individual devices are large, expensive and consequently utilized  
22 only in commercial applications.

23 Spas are popular in part because of their ability to be made  
24 inexpensively, and thus sold inexpensively. This is due primarily  
25 to the fact that they can be made in a single seamless unit using  
26 low cost manufacturing methods such as vacuum-forming thermo  
27 plastic. This method works because of the shallow nature of the  
28 spa (typically no more than 2-3 feet deep), that minimizes the

1 need to consider excessive weight and water pressure problems.  
2 Other spa manufacturing processes include the forming of fiberglass  
3 or acrylic around a mold.

4 Conversely, a swim jet device has typically at least sixty  
5 (60) square feet of surface area (typically around 14 feet long by  
6 4 to 5 feet wide) so that an adult swimmer can extend lengthwise  
7 with fully stretched arms during the swimming motion. Moreover,  
8 these tend to be deeper to allow the full downward extension of the  
9 arm during swimming. Consequently these devices are large and have  
10 required piece by piece construction of a large tank for that  
11 purpose. The extra depth of those devices provides additional  
12 significant water pressure at the lower depths as there can be 1500  
13 to 2000 gallons of water in such a tank.

14 Aquatic treadmill chambers or pools require even additional  
15 depth so that an individual can stand at least chest high in the  
16 water while walking or running on the treadmill. At this level, it  
17 is often as much as 5 feet deep. Prior art treadmill devices  
18 include primarily chambers where an individual climbs in and water  
19 is brought in to that individual under a supervised setting, or  
20 larger pools where the treadmill is, in an expensive arrangement,  
21 raised to the top of the pool while the user walks on, then lowered  
22 down to the bottom. In either event, these devices can have  
23 typically several thousand gallons of water, and in a depth of 5  
24 feet require special considerations for significantly greater  
25 weight and water pressure at the lower depths, and special  
26 considerations for easily allowing maintenance, adjustment of the  
27 treadmill, easy egress and ingress to the lower depths for patients  
28 in therapy that cannot walk up and down ladders, and require other

1 individuals to assist either in supervising or raising or lowering  
2 of the treadmill platform; also extra safety considerations have to  
3 be taken into account as one runs in place on the treadmill at the  
4 bottom of the chamber. These enclosures are also usually  
5 constructed piece by piece rather than in a single seamless format.

6 To combine all three types of activities and devices discussed  
7 above into one seamless modular format results in a still larger  
8 pool that not only has large surface area for the swim in place  
9 swim jet arrangement, but also an extra deep pool to allow for one  
10 to stand up for the treadmill exercises, heretofore not done in any  
11 seamless device format that would allow for inexpensive  
12 construction that is structurally sound, easy to ship to the  
13 consumer, easy to install and use for consumer use, that is easy  
14 to maintain and adjust, and is likewise safe with minimized  
15 supervision required in the consumer setting.

16 It is therefore the object of this invention to provide just  
17 such a combination, multiuse device: an all in one, inexpensive,  
18 easy to use and maintain, primarily consumer device that is highly  
19 functional. This is accomplished by utilizing what is currently  
20 known to be the deepest vacuum thermo plastic created seamless spa  
21 tank. It utilizes unique design features to not only strengthen  
22 the structural integrity at the bottom depth of the pool, but also  
23 to provide an integrated treadmill receiving pan or cavity that  
24 secures the treadmill. It also allows the treadmill top to be  
25 flush with an integrated safety step off area around the treadmill,  
26 such that the snug fit in the pan leaves a minimal distance between  
27 the treadmill and the side of the container, at flush level,  
28 covered with a safety cover, all creating an attractive and safe,

1 common, flush and level treadmill/floor bottom. An access chamber  
2 for access to the treadmill shaft is also provided. The tank has  
3 steps integrated into the tank structure, with rise and runs  
4 designed for the intended use. The tank has structural stiffening  
5 ribs encircling the tank in equivalently spaced relationship  
6 between the top and bottom of the container. This allows the tanks  
7 to combine for easy shipment of multiple units for mass production.  
8 Consequently the tank can be manufactured and shipped  
9 inexpensively, and installed easily, in relatively large numbers.

10 Other objects and features of the invention and the manner in  
11 which the invention achieves its purpose will be appreciated from  
12 the foregoing and the following description and the accompanying  
13 drawings which exemplify the invention, it being understood that  
14 changes may be made in the specific method and apparatus disclosed  
15 herein without departing from the essentials of the invention set  
16 forth in the appended claims.

DESCRIPTION OF THE DRAWINGS:

Figure 1 is a top view of the invention.

Figure 2 is a side view of the invention.

Figure 3 is an end view of the invention.

Figure 4 is a side view of the bottom (middle portion of bottom omitted as indicated by line breaks) showing the motor at one end.

Figure 5 is a side view of the treadmill.

Figure 6 is a side view of the tension adjusting mechanism.

Figure 7 is a top view of the treadmill.

Figure 8a is a top view of the treadmill assembly showing the cross-suspension base channels.

Figure 8b is a side view of the treadmill assembly showing the individual suspension units.

Figure 9 is a side view of the individual suspension units.

1 DESCRIPTION OF THE PREFERRED EMBODIMENTS:

2 The preferred mode of the invention is shown in Figure 1. The  
3 tank 3 is, a single seamless enclosure, having a depth of at least  
4 5 feet 4 inches. An individual can stand, run or walk on the  
5 treadmill 35. As discussed the seamless containers of this depth  
6 require special considerations for structural integrity due to the  
7 enormous amount of water pressure at the lower depths. Here,  
8 seamless refers to any molded device, whether built on top of a  
9 mold or vacuumed formed to a mold. Plastic, as used herein, refers  
10 to any polyvinyl, polymer, plastic material, man made or otherwise,  
11 and also includes acrylic and fiberglass.

12 Tank 3, at a minimum 14 feet long (sufficient to allow an  
13 adult individual to tread or swim at the top) provides for a  
14 minimum of 2200 gallons of water or more. Such an incredibly large  
15 amount of water creates tremendous water pressure at the lower  
16 depths. Moreover, the constant running and moving activity of an  
17 individual in the pool provides additional stress on the structure  
18 as the water is agitated at the lower depths. To create the single  
19 seamless tank of the tremendous size involved, capable of handling  
20 the moving treadmill and other significant water jet motion  
21 therein, special considerations must be given. A thermo plastic  
22 method for creating tubs is typically used where a large sheet of  
23 plastic material is heated and then pulled by vacuum (vacuum-  
24 formed) against the surface of a forming mold. To this inventor's  
25 knowledge, no vacuum-formed structure of this size and more  
26 particularly this depth has been created because of the  
27 difficulties in drawing the plastic to such a depth, while  
28 retaining the sufficient structural integrity at the lower depths

1 to handle the greater water pressure and depths.

2 The invention not only achieves structural integrity by  
3 providing a smaller recess having stiffening bends and corners at  
4 42, 43, 44 and 45 this recess structure also provides a treadmill  
5 receiving pan or cavity that also defines a safety step off  
6 landing.

7 The treadmill 35 fits snugly within the cavity and is attached  
8 utilizing screws and other affixing devices (that do not penetrate  
9 completely through the plastic structure), at 36, 37, 38 and 40.  
10 By having the recess perimeter 32 much smaller than the next  
11 highest rib 52, a safety walk off ledge 54 is created surrounding  
12 the treadmill. The spacing 56 around the treadmill between the  
13 treadmill and the tank perimeter 32 is minimized (in the preferred  
14 mode 3/4 inch). A drive shaft access chamber 27 is created (shown  
15 also as 51 in Figure 3) to allow the treadmill drive shaft to  
16 penetrate the tank. The chamber also provides clearance for  
17 assembling the treadmill into the tank. The treadmill shaft with  
18 corresponding drive wheel pulley shaft 23 and drive wheel pulley 25  
19 so as to connect to the motor 19 sitting on motor mount 21, via the  
20 smaller motor pulley 18 and corresponding belt 16. A cover plate  
21 covers not only the maintenance access chamber 27, but also the gap  
22 56 that surrounds the treadmill. The cover plate is preferably of  
23 flat stainless steel material approximately 5 inches wide in the  
24 preferred mode. The cover plate covers not only the outer frame 60  
25 of the treadmill, but it also extends over to reach a small portion  
26 of the tank recess perimeter 32.

27 By creating the cavity 32 to fit the treadmill could create  
28 additional problems could be created by limiting access to adjust

1 the tension of the treadmill. Obviously it is not desirable to  
2 empty the tank of 2200 gallons of water to make simple tension  
3 adjustments that sometimes are required on the treadmill.  
4 Consequently, it is necessary to adjust the treadmill from above  
5 without lifting the treadmill out, something that is extremely  
6 physically difficult at the depths of water involved. Belt tracking  
7 is also important for not only quality control, but to decrease  
8 maintenance requirements on the entire treadmill if the belt is not  
9 continuously maintained in an optimum position. Consequently easy  
10 access to adjust the belt by a typical consumer is important. This  
11 easy access is achieved via vertical access to an adjustment  
12 mechanism 14. One can simply extend into the water a long wrench,  
13 access the adjustment mechanism 14 from above in this fashion, and  
14 by turning the same either clockwise or counter-clockwise, adjust  
15 the belt tension. A similar corresponding adjustment mechanism 16  
16 exists on the opposing side of the treadmill belt. Adjustment of  
17 these two in combination provides for the correct tensioning of the  
18 treadmill. A detailed description of the tension adjusting  
19 mechanisms 14 and 16 are discussed further herein.

20 To provide additional strength for such a large modular  
21 container, periodic ribs are spaced from top to bottom. In one  
22 mode, these ribs 61, 63, 65 and 67 also correspond with steps 71,  
23 73, 75 and 77 (also 11, 9, 7 and 5).

24 In the swimming mode, swim jets 31 and 33 have outlets 47 and  
25 49 connected to pump and motor means that forces water out the jets  
26 from the front end in which they are located to the opposing rear-  
27 end so as to create a sufficiently powerful and fast flow of moving  
28 water to allow a swimmer to swim in place, much like a runner runs



1 in place on the treadmill. Controls at 29, in the preferred mode  
2 are comprised of a control panel board with the necessary switches  
3 to control not only the power and speed of the swim jets to allow  
4 for slower or faster swimming, but also the power and speed of the  
5 treadmill. The control panel also provides an emergency stop  
6 means.

7 Figure 4 discloses a close-up side view of the motor and  
8 treadmill assembly (on the opposing side wall from that shown in  
9 Fig. 1). The motor 81 rotationally moves the smaller pulley wheel  
10 83 to rotate the belt 85 that is connected to the larger pulley 87  
11 driving the shaft 89 to the treadmill. The shaft penetrates the  
12 tank through a hole provided in the tank located in the side of the  
13 treadmill receiving cavity. To prevent leaks, it is desired in the  
14 preferred mode that this portion of the pan (where that hole is  
15 drilled) be more vertical. A pressure seal is utilized between the  
16 tank and the treadmill drive shaft.

17 Also shown in Figure 4 is a side view of the tension  
18 adjustment means 91 shown in more detail in Figure 5 and 6, tension  
19 means is comprised of a rigid wedge shaped member 90 having  
20 elongated threaded hole 94 through which correspondingly threaded  
21 pin 95 extends, the non threaded tip of which extends through base  
22 plate 96. The pin is comprised of a hex headed bolt, access to  
23 which is gained through a hole in the frame of the treadmill. As  
24 the bolt is rotated counter-clockwise (looking down from above),  
25 the rigid wedge shaped member 94 is forced downward and places  
26 pressure against the treadmill roller 97 forcing the treadmill  
27 roller 97 backwards further into adjusting slot 98 in which the  
28 shaft 99 of the roller rests. Consequently, such an adjustment

1 tightens the belt. To reduce the tension on the treadmill belt,  
2 the bolt-pin 95 is rotated in the opposite direction and  
3 correspondingly moves the wedge shaped member upwards allowing the  
4 treadmill roller and shaft to move forward.

5 Figure 5 also shows a side view of the treadmill with optional  
6 support bar 92 removably inserted into corresponding holes 93 in  
7 the treadmill.

8 Figure 7 shows a top detailed view of the treadmill with cover  
9 plate 100. It will be seen that the cover plate extends over the  
10 lip 32 (32 in Figure 1 and in Figure 7 are the same) of the  
11 treadmill recess cavity in the tank.

12 In the preferred mode, the treadmill has suspension/cushioning  
13 means, shown in Figure 8a, 8b, and 9, to cushion the impact of the  
14 feet against the treadmill so as to ease the impact physiologically  
15 on the feet, knees, legs, etc. during running. Upper channel  
16 members 110, 112, 114, 116, 118, 120, 122, 128 each have two ends,  
17 each end connected to the top portion of a suspension device (130,  
18 132, 134, 136, 138, respectively). Each suspension device is  
19 connected to rigid 'C' channel treadmill frame side members 140  
20 respectively. The individual suspension devices are shown in more  
21 detail in Figure 9. The upper channel member 150 is itself an  
22 upside down rigid 'C' channel member, for receiving in its interior  
23 152 a correspondingly shaped top portion 154 of an elastomer member  
24 156, which top portion is smaller than the bottom portion (base)  
25 158 of the elastomer member 154, thus creating a 'stop' or ledge  
26 160 for extra support and securability of the 'C' channel 150. The  
27 base 158 rests snugly upon, and is connected to, base member 170,  
28 which base channel member is connected to the frame of the

1 treadmill and extends to the opposing side base channel member.  
2 'C' channel 150 is smaller than 'C' channel 170 to provide  
3 clearance as the elastomer is compressed. The elastomer is defined  
4 as any material having the compression properties of a hard  
5 rubberlike material, that tend to compress or absorb energy upon  
6 impact. The treadmill upper platform 172, on which the treadmill  
7 belt rides, is connected to each of the upper channels. Thus, in  
8 use, when an impact occurs against the treadmill during running,  
9 the treadmill compresses the appropriate elastomer material of the  
10 corresponding suspension device, causing the elastomer to compress  
11 accordingly and absorb the energy of the impact. In another mode  
12 of the invention, the treadmill has padding means 180 for creating  
13 an additional cushion for impact absorption. The padding means 180  
14 is comprised of any soft rubber-like material, or material having  
15 compression properties, situated on the underside of the platform  
16 172.

17 Consequently, it will be seen that what has been invented is  
18 a single tank unit of a significant depth and size to allow an  
19 individual easy ingress and egress to exercise on the treadmill or  
20 a full length swim in place swim jet apparatus, that allows for  
21 safe use by the user by allowing for safety step off landing flush  
22 with the treadmill in a structurally sound fashion and one that  
23 allows relatively easy maintenance and access for tension  
24 adjustment at the significant depths involved. The single modular  
25 unit also allows for easy and inexpensive construction by allowing  
26 for thermo plastic vacuum-formed construction, and easy  
27 installation of a single unit.

28 While there have been shown and described particular embodi-

ments of the invention, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention or its equivalent, and, therefore, it is intended by the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.